(g) For multiengine airplanes, information identifying each operating condition in which the fuel system independence prescribed in § 23.953 is necessary for safety must be furnished, together with instructions for placing the fuel system in a configuration used to show compliance with that section.

(h) For each airplane showing compliance with § 23.1353 (g)(2) or (g)(3), the operating procedures for disconnecting the battery from its charging source must be furnished.

(i) Information on the total quantity of usable fuel for each fuel tank, and the effect on the usable fuel quantity, as a result of a failure of any pump, must be furnished.

(j) Procedures for the safe operation of the airplane's systems and equipment, both in normal use and in the event of malfunction, must be furnished.

[Doc. No. 27807, 61 FR 5194, Feb. 9, 1996]

§ 23.1587 Performance information.

Unless otherwise prescribed, performance information must be provided over the altitude and temperature ranges required by § 23.45(b).

(a) For all airplanes, the following information must be furnished—

(1) The stalling speeds V_{SO} and V_{S1} with the landing gear and wing flaps retracted, determined at maximum weight under § 23.49, and the effect on these stalling speeds of angles of bank up to 60 degrees;

(2) The steady rate and gradient of climb with all engines operating, determined under § 23.69(a);

(3) The landing distance, determined under § 23.75 for each airport altitude and standard temperature, and the type of surface for which it is valid;

(4) The effect on landing distances of operation on other than smooth hard surfaces, when dry, determined under § 23.45(g); and

(5) The effect on landing distances of runway slope and 50 percent of the headwind component and 150 percent of the tailwind component.

(b) In addition to paragraph (a) of this section, for all normal, utility, and acrobatic category reciprocating engine-powered airplanes of 6,000 pounds or less maximum weight, the steady angle of climb/descent, determined under § 23.77(a), must be furnished.

(c) In addition to paragraphs (a) and (b) of this section, if appropriate, for normal, utility, and acrobatic category airplanes, the following information must be furnished—

(1) The takeoff distance, determined under § 23.53 and the type of surface for which it is valid.

(2) The effect on takeoff distance of operation on other than smooth hard surfaces, when dry, determined under § 23.45(g);

(3) The effect on takeoff distance of runway slope and 50 percent of the headwind component and 150 percent of the tailwind component;

(4) For multiengine reciprocating engine-powered airplanes of more than 6,000 pounds maximum weight and multiengine turbine powered airplanes, the one-engine-inoperative takeoff climb/descent gradient, determined under § 23.66;

(5) For multiengine airplanes, the enroute rate and gradient of climb/descent with one engine inoperative, determined under § 23.69(b); and

(6) For single-engine airplanes, the glide performance determined under § 23.71.

(d) In addition to paragraph (a) of this section, for commuter category airplanes, the following information must be furnished—

(1) The accelerate-stop distance determined under § 23.55;

(2) The takeoff distance determined under § 23.59(a);

(3) At the option of the applicant, the takeoff run determined under § 23.59(b);

(4) The effect on accelerate-stop distance, takeoff distance and, if determined, takeoff run, of operation on other than smooth hard surfaces, when dry, determined under § 23.45(g);

(5) The effect on accelerate-stop distance, takeoff distance, and if determined, takeoff run, of runway slope and 50 percent of the headwind component and 150 percent of the tailwind component;

(6) The net takeoff flight path determined under § 23.61(b);

(7) The enroute gradient of climb/descent with one engine inoperative, determined under § 23.69(b);

(8) The effect, on the net takeoff flight path and on the enroute gradient of climb/descent with one engine inoperative, of 50 percent of the headwind component and 150 percent of the tailwind component;

(9) Overweight landing performance information (determined by extrapolation and computed for the range of weights between the maximum landing and maximum takeoff weights) as follows—

(i) The maximum weight for each airport altitude and ambient temperature at which the airplane complies with the climb requirements of § 23.63(d)(2); and

(ii) The landing distance determined under § 23.75 for each airport altitude and standard temperature.

(10) The relationship between IAS and CAS determined in accordance with § 23.1323 (b) and (c).

(11) The altimeter system calibration required by § 23.1325(e).

[Doc. No. 27807, 61 FR 5194, Feb. 9, 1996]

§ 23.1589 Loading information.

The following loading information must be furnished:

(a) The weight and location of each item of equipment that can be easily removed, relocated, or replaced and that is installed when the airplane was weighed under the requirement of § 23.25.

(b) Appropriate loading instructions for each possible loading condition between the maximum and minimum weights established under § 23.25, to facilitate the center of gravity remaining within the limits established under § 23.23.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23–45, 58 FR 42167, Aug. 6, 1993; Amdt. 23–50, 61 FR 5195, Feb. 9, 1996]

APPENDIX A TO PART 23—SIMPLIFIED DESIGN LOAD CRITERIA

A23.1 *General.*

(a) The design load criteria in this appendix are an approved equivalent of those in §§ 23.321 through 23.459 of this subchapter for an airplane having a maximum weight of 6,000 pounds or less and the following configuration:

(1) A single engine excluding turbine powerplants;

(2) A main wing located closer to the airplane's center of gravity than to the aft, fuselage-mounted, empennage;

(3) A main wing that contains a quarter-chord sweep angle of not more than 15 degrees fore or aft;

(4) A main wing that is equipped with trailing-edge controls (ailerons or flaps, or both);

(5) A main wing aspect ratio not greater than 7;

(6) A horizontal tail aspect ratio not greater than 4;

(7) A horizontal tail volume coefficient not less than 0.34;

(8) A vertical tail aspect ratio not greater than 2;

(9) A vertical tail platform area not greater than 10 percent of the wing platform area; and

(10) Symmetrical airfoils must be used in both the horizontal and vertical tail designs.

(b) Appendix A criteria may not be used on any airplane configuration that contains any of the following design features:

(1) Canard, tandem-wing, close-coupled, or tailless arrangements of the lifting surfaces;

(2) Biplane or multiplane wing arrangements;

(3) T-tail, V-tail, or cruciform-tail (+) arrangements;

(4) Highly-swept wing platform (more than 15-degrees of sweep at the quarter-chord), delta planforms, or slatted lifting surfaces; or

(5) Winglets or other wing tip devices, or outboard fins.

A23.3 *Special symbols.*

n_1=Airplane Positive Maneuvering Limit Load Factor.

n_2=Airplane Negative Maneuvering Limit Load Factor.

n_3=Airplane Positive Gust Limit Load Factor at V_C.

n_4=Airplane Negative Gust Limit Load Factor at V_C.

n_{flap}=Airplane Positive Limit Load Factor With Flaps Fully Extended at V_F.

$$* V_{F\ min} = \text{Minimum Design Flap Speed} = 11.0\sqrt{n_1 W/S} \quad [\text{kts}]$$

$$* V_{A\ min} = \text{Minimum Design Maneuvering Speed} = 15.0\sqrt{n_1 W/S} \quad [\text{kts}]$$

$$* V_{C\ min} = \text{Minimum Design Cruising Speed} = 17.0\sqrt{n_1 W/S} \quad [\text{kts}]$$

$$* V_{D\ min} = \text{Minimum Design Dive Speed} = 24.0\sqrt{n_1 W/S} \quad [\text{kts}]$$